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P A P E R S
IN
C H E M I S T R Y .

No. I.

APPARATUS FOR INSTANTANEOUS LIGHT.

The SILVER ISIS MEDAL was presented to Mr. GEORGE JACKSON, 30, Church Street, Spitalfields, for his Apparatus for Instantaneous Light, which has been placed in the Society's Repository.

30, Church Street, Spitalfields,
April 25, 1827.

SIR,

I BEG leave to inform you that I have contrived what I conceive to be an improvement on the apparatus usually employed for obtaining light by means of hydrogen gas and spongy platinum, and I shall feel particularly obliged by your laying the same before the Society of Arts.

The objects which I had in view in constructing this apparatus were *simplicity* and *cheapness*. In these I have so far succeeded, that the uncovering of the cap of platinum is rendered unnecessary, and a taper is fixed in a situation to be lighted by simply turning the cock; and the instrument can be sold at about half the price of those in common use.

My attention was turned to this subject by frequently

having occasion for a light when called to the practice of my profession by night. I tried in succession the phosphorus bottle and the oxygenated matches, and was fitting up an instrument on Volta's plan, when Dobereiner's discovery of the action of hydrogen on spongy platinum was made public. I then substituted a cup with platinum for the electrophorus, and in that state used the apparatus for a long time before I thought of making any improvement on it.

The instrument which I have the honour of laying before the Society, consists of an inverted syphon, made of stout glass tube, about half an inch outside diameter, having a ball, about two inches and a quarter diameter, blown on each leg. The bend of the syphon is cemented into a wooden foot, loaded with lead, and the ball on the longer leg stands about six inches (measuring from centre to centre) above that on the shorter one. The tube extends about an inch above each ball. That from the upper one is simply covered with a loose brass cap, more for ornament than use. On that which rises from the lower ball a brass cap is cemented, into the top of which a brass plug is ground, with a hole drilled across it, met by another drilled up the centre, so as to form a stopcock. A jet with a fine orifice is screwed into the side of the cap, so as to communicate with the lower ball through holes in the plug when the latter is turned; and just below the jet an arm projects, which carries a short piece of brass tube, lying horizontally, that serves to support the platinum, and protect it from accidental displacement. The end of a thin platinum wire is formed into a small helix of two or three turns, by bending it round a wire or glass rod, and is covered with moist ammonio-muriate of platinum. It is then heated to redness in the flame of a

spirit-lamp, again coated with the ammonio-muriate, and again heated, so as to form a platinum sponge, from the size of a pepper-corn to that of a pea. The wire is then attached to a ring, made of brass tube, of a size to admit of being pushed tightly into that which is supported by the arm; so that the platinum sponge hangs in the centre of the tube directly before the jet. In the arm above mentioned, between the jet and the platinum, and a little to the side, is a hole just large enough to contain a piece of wax taper, the wick of which is thus placed so as not to obstruct the jet of gas, but yet near enough to be lighted when the gas is inflamed. In the part of the tube between the bend of the syphon and the lower ball, a cork, grooved at the sides, is inserted, to prevent the zinc from falling into the bend.

To charge the instrument for use, the brass plug is taken out, and a number of narrow slips of zinc, about two inches long (cut from a piece of the thin malleable metal), are introduced into the lower ball, which is then nearly filled with diluted sulphuric acid, poured through the upper orifice. As soon as a brisk action commences, the plug is replaced, and the gas, accumulating in the lower ball, drives the acid into the upper one, when the production of gas ceases. The lower ball being thus filled with hydrogen, on turning the plug a portion of it escapes through the jet, becomes ignited by its action on the platinum sponge, and lights the taper, a portion of acid at the same time descending from the upper ball, acting on the zinc, and causing a fresh production of gas. It is not very material how much the acid is diluted: that which I have used is made by mixing one measure of oil of vitriol with about ten measures of water, and it answers very well.

In the instrument in the Society's possession, the upper ball is about six inches (from centre to centre) above the lower one. I have since made one wherein the distance is only four inches, and I think it lights with rather less expenditure of gas.

To prepare the ammonio-muriate of platinum, a solution of the metal in nitro-muriatic acid is dropped into a solution of muriate of ammonia in distilled water, and the yellow precipitate is collected on a filter. Should it become dry, it must be moistened with *distilled* water.

I am, Sir,

&c. &c. &c.

A. AIKIN, Esq.

GEORGE JACKSON.

Secretary, &c. &c.

Reference to Mr. Jackson's Platina Light.

Figure 13. Plate I.

a. The stopper through which the zinc is introduced into the bulb *b*; it is prevented falling lower than *c* by a notched cork placed within. Diluted sulphuric acid is poured in through the bulb *d* till it fills the bulb *b*; the stopper *a* is then put in, and as the hydrogen gas is generated, the liquid is forced down through the bottom *c* into the tube *e* and the bulb *d*, so that none remains in contact with the zinc. The stopper *a* also forms the cock, it being hollow, as shewn in section, fig. 14; and on turning its lateral aperture opposite the jet *f*, the gas is pressed out by the weight of the fluid in *d* and *e*, and blows against a piece of spongy platina suspended by platina wire in the short tube *g*; the platina becoming

hot, kindles the gas which heated it, and this flame lights the wax taper *h*, which is stuck in a hole in the arm *i*; this hole is so much on one side of the jet as to let the wick only just touch the flame; the arm *i*, which holds the taper, is soldered to the brass neck *j* and to the tube *g*. Fig. 15 is a full-sized section of the tube *g*; within it slips a shorter ring of tube *k*, round the upper part of which the wire is twisted that holds the spongy platina; thus the platina, though hanging loose, is protected from accident, and is always opposite the jet.

No. II.

PURIFICATION OF LINSEED OIL.

The SILVER ISIS MEDAL and TEN POUNDS were presented to Mr. THOMAS COGAN, for his Method of Purifying Linseed Oil.

OF the seed-oils, those which are in the greatest demand are from rapeseed and from linseed. In France and in most other parts of continental Europe, rapeseed oil is that which is generally used for lamps; but it will not give a clear light till it has been freed from the mucilage and other matters which, when heated, become charred, and thus load the wick, and, by obstructing the capillary attraction, impair the free supply of oil. Acids, properly applied, will precipitate the mucilage; but long subsidence or tedious filtration are necessary for this purpose; and, after all, the oil is found still to retain